

## **Appendix I**

### **ARCHITECTURE AND CONSTRUCTION YOUTH APPRENTICESHIP**

#### **COURSE OUTCOME SUMMARY: OVERVIEW AND TABLE OF CONTENTS**

## Architecture & Construction Youth Apprenticeship Course Outcome Summary

### Course Information

<b>Organization</b>	Cooperative Educational Service Agency (CESA) 6 Consortium; WI
<b>Developers</b>	Tania Kilpatrick, Rita O'Brien, Kari Krull and Cyndy Sandberg
<b>Development Date</b>	June 2014

### Description

This curriculum describes the performance-based worksite Competencies, Performance Standards, and Learning Objectives for the Wisconsin Youth Apprenticeship (YA) Program in Architecture and Construction. The Wisconsin Architecture and Construction YA Program is designed to provide students with a working understanding of core industry skills and occupationally specific technical skills that serve as the standard for occupations in the Architecture and Construction industry. This program provides the framework for educators and industry to work together to produce work-ready, entry-level employees that will compete favorably in a global market, as well as, provide for post-secondary educational advancement while integrating work-based learning in the school and worksite.

The Architecture and Construction YA program competencies are aligned with the national States' Career Cluster Skill Standards maintained by the States' Career Clusters project (<http://www.careertech.org/>), as well as applicable skills in the Project Lead the Way (<http://www.pltw.org/>) Curriculum and STEM Academy (<http://www.stem101.org/index.asp>) The Wisconsin Standards for Technology and Engineering were also used for standards development. Architecture and Construction YA students are required to complete OSHA 10 and First Aid training as well as perform all of the Core and Safety skills for the pathway they enroll in. **Level One (one year)** YA students are to choose additional competencies from one of the skilled trades area within the Construction Pathway or the REQUIRED Architecture and Construction Unit in the specific pathway. **Level Two (two year)** YA students are to complete all of the Level One requirements plus an additional unit within their chosen pathway.

Pathway choices:

- Construction Pathway
  - Carpentry Unit
  - Electrical Unit
  - Masonry/Concrete Unit
  - Mechanical/HVAC Unit
  - Plumbing/Sprinkler Fitting Unit
  
- Design/Pre-Construction
  - Architectural Drafting Unit – REQUIRED FIRST
  - Architectural Planning Unit
  -

**EACH competency** (work site skill) is listed with its corresponding Performance Standards and Learning Objectives. The Performance Standards describe the behaviors, **as applicable**, that employers should look for in order to evaluate the competency. The Learning Objectives describe the classroom learning content for the required related technical instruction.

## Curriculum Sources

- Wisconsin Standards for Technology and Engineering, WI Department of Public Instruction, May 2013.
- California State Board of Education. California High School K12 Standards for Career Technical Education, May 2005.
- Illinois Occupational Skill Standards for Architecture Drafting & Design, Illinois Occupational Skill Standards and Credentialing Council, accessed September 2014 online at <http://www.ioes.org/ctecurriculum-skillstandards.cfm>.
- Mid-continent Research for Education and Learning standards for Engineering Education. <http://www.mcrel.org/compendium/SubjectTopics.asp?SubjectID=28>. Accessed September 2014.
- Fox Valley Technical College Dean of Manufacturing and Construction, Mike Cattalino; Northeast Wisconsin Technical College, Dean, Trades and Engineering Technologies, Mark Weber; Northeast Wisconsin Technical College, Apprenticeship Manager, Todd Kiel; Tania Kilpatrick, CESA 6 CTE Coordinator, 2014.
- Milwaukee Area Technical College, Course Outcome Summary proposed revisions for Mechanical & Environmental Systems I (10/20/10), Mechanical & Environmental Systems II (10/20/10), and Structural Systems & Components (10/20/10).
- Oklahoma Career Tech Skills Standards for Drafting: Architectural Drafter (OD42702), 2007, and for Drafting Technician (OD42701), 2007.
- Project Lead the Way Curriculum Outline of Learning Objectives, <http://www.pltw.org>. Curriculum obtained with permission from Ken Maguire, September 2010.
- States' Careers Clusters, Architecture & Construction Career Cluster Knowledge and Skills charts for Cluster Skills, Design/Pre-Construction, and Construction, <http://www.careertech.org/>. Accessed September 2014.
- STEM Academy Curriculum Outline of Learning Objectives, <http://www.stem101.org/index.asp>. Curriculum obtained with permission from Dr. Alan Gomez, September 2014.
- U.S. Department of Labor, Residential Construction Industry Competency Model. <http://www.careeronestop.org/CompetencyModel/pyramid.aspx?CONR=Y>. Accessed September 1, 2014.
- Wikipedia, various Architectural Drafting Processes, <http://www.wikipedia.org/>. Accessed October 2010-March 2011.
- Wisconsin Administrative Code, Department of Workforce Development, Chapter 270, Child Labor, (dated August 2005) and Wisconsin State Statutes Chapter 106, Apprenticeship, Employment and Equal Rights Program.

- Wisconsin Department of Workforce Development, Jim Chiolino, Labor Standards Bureau, Child Labor Laws, 2011 (Revised, June 2014).
- Wisconsin Department of Workforce Development, Architecture YA Advisory Review Committee, formed September 2010 for the purpose of revising and updating the Drafting & Design- Architectural Design Youth Apprenticeship curriculum.
- Wisconsin Department of Workforce Development, Drafting & Design- Architectural Design Youth Apprenticeship DACUM, April, 28, 1994.
- Worknet Occupation Task Lists for Architectural Drafters and Architects (except landscape or naval), <http://worknet.wisconsin.gov/worknet/default.aspx>. Accessed August 2014.

**Architecture & Construction Youth Apprenticeship**  
**Table of Contents**  
**REQUIRED SKILLS**

**APPENDIX J**

**Unit 1: Core Skills**

1. Apply applicable academic knowledge
2. Apply applicable career knowledge
3. Apply Architecture and Construction industry knowledge
4. Communicate effectively
5. Take direction and corrective feedback
6. Act professionally
7. Demonstrate customer service skills
8. Cooperate with others in a team setting
9. Think critically
10. Exhibit legal and ethical responsibilities
11. Use basic technology
12. Use resource wisely

**Unit 2: Safety**

1. Follow personal safety requirements
2. Maintain a safe work environment
3. Demonstrate professional role to be used in an emergency

**Unit 3: Certifications**

1. Occupational Safety and Health Administration (OSHA) 10 Training
2. First Aid

**APPENDIX K**

**UNIT 4: Construction Pathway: Carpentry Fundamentals Unit**

1. Read blueprints, plans and specifications
2. Interpret symbols and procedures
3. Identify job prep needs and develop job task plan
4. Execute job prep needs as a coordinated effort
5. Select tools and materials
6. Use hand tools and light duty tools
7. Operate tools and equipment safely
8. Assist with the installation of materials per job specifications
9. Demonstrate accuracy in measuring using various instruments
10. Maintain clean and safe work environment
11. Clean up work area
12. Practice quality craftsmanship
13. Assist with rough framing or forming
14. Assist with finish framing or forming
15. Assist with interior finishing
16. Assist with exterior finishing

## **APPENDIX L**

### **UNIT 5: Construction Pathway: Electrical Fundamentals Unit**

1. Read blueprints, plans and specifications
2. Interpret symbols and procedures
3. Identify job prep needs and develop job task plan
4. Execute job prep needs as a coordinated effort
5. Select tools and materials
6. Use hand tools and light duty tools
7. Operate tools and equipment safely
8. Assist with the installation of materials per job specifications
9. Demonstrate accuracy in measuring using various instruments
10. Maintain clean and safe work environment
11. Clean up work area
12. Practice quality craftsmanship
13. Assist with cutting wire, cable, conduit and raceway, cording and cutting chasses
14. Assist with pulling wires and attaching wires
15. Assist with connecting conductors to switches, receptacles or appliances
16. Assist with installation of switches, outlet boxes and fixture boxes
17. Assist in rough-in feeders and circuits

## **APPENDIX M**

### **UNIT 6: Construction Pathway: Masonry/Concrete Fundamentals Unit**

1. Read blueprints, plans and specifications
2. Interpret symbols and procedures
3. Identify job prep needs and develop job task plan
4. Execute job prep needs as a coordinated effort
5. Select tools and materials
6. Use hand tools and light duty tools
7. Operate tools and equipment safely
8. Assist with the installation of materials per job specifications
9. Demonstrate accuracy in measuring using various instruments
10. Maintain clean and safe work environment
11. Clean up work area
12. Practice quality craftsmanship
13. Assist with cutting brick and block
14. Assist with depositing, spreading, consolidating, and striking of concrete in a form
15. Lay masonry units to job specification
16. Assist with selecting the appropriate materials for the job
17. Perform volume estimates for concrete quantity requirements

## **APPENDIX N**

### **UNIT 7: Construction Pathway: Mechanical/HVAC Fundamentals Unit**

1. Read blueprints, plans and specifications
2. Interpret symbols and procedures
3. Identify job prep needs and develop job task plan
4. Execute job prep needs as a coordinated effort
5. Select tools and materials
6. Use hand tools and light duty tools
7. Operate tools and equipment safely
8. Assist with the installation of materials per job specifications
9. Demonstrate accuracy in measuring using various instruments

10. Maintain clean and safe work environment
11. Clean up work area
12. Practice quality craftsmanship
13. Assist with basic equipment problem identification and diagnosis for heating and cooling systems
14. Assist with basic equipment repair for heating systems and cooling systems
15. Set up and fabricate metal
16. Assist with the installation of fabricated parts
17. Transfer measurements into a workable drawing

## **APPENDIX O**

### **UNIT 8: Construction Pathway: Plumbing/Sprinkler Fitting Fundamentals Unit**

1. Read blueprints, plans and specifications
2. Interpret symbols and procedures
3. Identify job prep needs and develop job task plan
4. Execute job prep needs as a coordinated effort
5. Select tools and materials
6. Use hand tools and light duty tools
7. Operate tools and equipment safely
8. Assist with the installation of materials per job specifications
9. Demonstrate accuracy in measuring using various instruments
10. Maintain clean and safe work environment
11. Clean up work area
12. Practice quality craftsmanship
13. Assist with the testing and maintenance of fixtures

## **APPENDIX P**

### **UNIT 9: Design/Pre-Construction Pathway: Architectural Drafting Unit**

1. Interpret technical drawings
2. Use measuring devices accurately
3. Organize databases, files and drawings
4. Reproduce documents and plans
5. Compile site measurements and other data
6. Use architectural drafting software
7. Develop 2D (orthographic) view drawings
8. Develop 3D view models
9. Dimension drawings
10. Apply lettering and basic annotation to drawings
11. Prepare working drawings
12. Assist to research building code and site requirements
13. Participate on an architectural design project

## **APPENDIX Q**

### **Unit 10: Design/Pre-Construction Pathway: Architectural Planning Unit**

1. Draw a site plan
2. Draw sectional and elevation views
3. Draw a floor plan
4. Develop a stair section drawing
5. Draw a floor system and foundation plan
6. Draw a framing plan
7. Draw a roof framing plan
8. Develop sustainable/conservation elements into a design
9. Review completed architectural plans and documents
10. Revise drawings
11. Construct a Bill of Materials
12. Assist to develop architectural detail schedules
13. Assist to coordinate architectural project activities